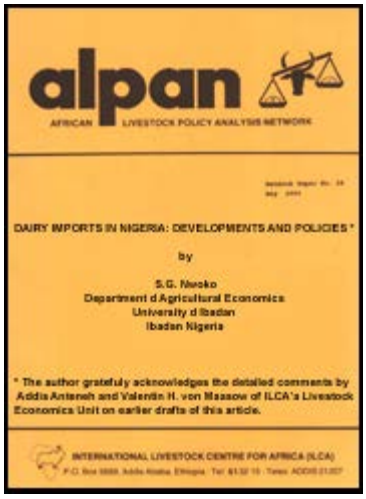
Dairy imports in Nigeria: Developments and policies



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Introduction

1. Amidst the prospects of prolonged food shortages in Nigeria, scholars are beginning to investigate the causes of and the cures for food shortage. Some are looking into the techniques of production, others are looking into the methods of processing, preservation, farm ownership or management systems, while still others are investigating government policies and programmes. Government policies are increasingly being recognized as a major factor affecting the performance of the agricultural sector in many African countries. In the livestock sector, one area, among several others, which has become a major concern is the dramatic rise in the value and volume of dairy imports into sub-Saharan Africa over the last two decades. And Nigeria holds a prominent position in the development of dairy imports. The purpose of this paper is to look into some of the causes contributing to the situation in Nigeria. These are explained by the constraints which affect domestic milk production and policies which seem to have specifically influenced dairy imports over the past 10 to 20 years.

2. The first part of the paper provides a brief background on the overall patterns of agricultural and livestock production, dairy imports, domestic milk production as well as milk consumption. The second part discusses some of the constraints impeding the growth of domestic milk production. The third part explores the policy objectives which have emerged from a number of actions taken by the Nigerian Government over the years as well as the import policy instruments employed to achieve these objectives. Part four discusses the likely effects of the policy instruments including the effect of increased domestic production on imports of different dairy products into Nigeria. Part five, on the other hand, assesses the likely effects of dairy imports policy on domestic milk production and uses two examples of policy options available to the government to discuss possible outcomes in qualitative terms. A brief discussion based on a preliminary quantitative estimate of the effect of several variables on domestic milk production is also included in this part. Part six considers the important question of comparative advantage and provides a preliminary assessment of Nigeria's position with regard to domestic milk production. The conclusion draws attention to the real option available to the government of the basis of the findings discussed earlier.

Background

3. From 1960, the year of independence, to 1984, Nigeria's population is estimated to have increased from 57.8 million to 93.0 million or at an average rate of growth of 2.5% per annum. But as shown in Table 1, the index of staple food production as well as that of aggregate agricultural production has been on the decline from a base year of 1975. Although the index of livestock production has risen above the base year value, with the exception of 1981 and 1983, the average rate of increase of about 1.5% per annum shows that the rate of growth in per caput production has been negative.

Table 1. Index of Agricultural Production, 1975-1983 (1975 = 100)

	Staple Crops	Livestock Index	Aggregate
1975	100	100	100
1976	88.7	103.7	93.9
1977	75.7	106.0	88.7
1978	70.8	109.3	88.5
1979	64.4	113.4	87.2
1980	67.6	117.1	89.4
1981	71.6	94.2	90.1
1982	73.8	104.4	92.5
1983	63.5	99.3	83.8

Source: Central Bank of Nigeria. Annual Report and Statement of Accounts (several years).

4. According to David-West (1978), milk consumption per caput in Nigeria ranged from 5 to 10 kg between 1974 and 1976. The Federal Ministry of Planning (1975) estimated that aggregate milk supply (i.e. domestic production plus net imports) was 600,000 tons (in whole milk equivalent) in 1975 or about 6.6 kg per caput. Current estimates (Nwoko, 1985a) put the aggregate milk supply in 1983 at 1.12 million metric tons equivalent to 12.4 kg per caput. More recent studies estimate that per caput consumption of milk increased at an annual rate of 6.3% between 1973 and 1981 (von Massow, 1984). In the face of negative per caput domestic production, Nigeria has therefore filled the gap between consumption and production by ever increasing imports (mainly commercial) of dairy products.

5. In 1980 the value of Nigeria's net imports of dairy products constituted 42% of the total value of sub-Saharan Africa's net dairy imports, and 73% of the value of Nigeria's net imports of milk and meat. At current prices, Nigeria's value of net imports increased by 1174% between 1970 and 1981 while the quantity of imports (whole milk equivalent) increased by 818% during the same period (FAO).

6. In Nigeria, marketed supplies of milk come mainly from three sources: indigenous Fulani herdsman, government dairies, and private milk reconstituting plants. Partly due to a poor milk collection system including low producer prices, and partly due to the segregated nature of the urban market (see later in the paper), up to 90% of the fresh milk produced by the Fulani herdsman does not find its way into the milk processing plants. Consequently, the market for

traditionally produced (Fulani) fresh milk is highly localized with surplus milk being sold either directly to consumers as fresh milk in markets near the source of production or converted into butter or sour milk or clarified butter fat or ghee.

7. Some government milk processing plants get part of their fresh milk supply from government dairies and some collect milk from local producers. While milk production from government dairies is insignificant (see later in the paper), milk collection from local producers is constrained by the limited number of milk processing plants in relation to the size and number of milk catchment areas. According to Obi (1983) there were only 11 government milk processing plants in 1983, and most of these have resorted to processing imported powdered milk rather than collecting domestically produced fresh milk (Nwoko, 1986). Also paradoxically, most of these state-owned plants operate at between 2040% of their capacity (World Bank, 1981).

8. Private milk processing plants are mainly engaged in recombining imported powdered milk for distribution to urban consumers. The high cost of collecting fresh milk, the poor state of rural roads as well as the seasonality of supply seem to be major factors for this and for the government milk plants preferring reconstituting imported powdered milk to processing domestically produced fresh milk (CARD, 1981).

9. For these as well as for other reasons which will be discussed shortly, the performance of domestic milk production in Nigeria has been very poor. With the increasing volume of imports, the rate of self-sufficiency (i.e. domestic milk production to total consumption) declined over the years. Table 2 shows the estimates of the rate of self-sufficiency calculated under three assumptions of milk yield per cow (Nwoko, 1985a). The last column of Table 2 also presents the rate of self-sufficiency based on FAO milk yield data ranging from 180 kg (1970) to 290 kg (1983).

10. From the table one can see that the self-sufficiency ratio has sharply declined over the years irrespective of which yield assumption we used. This can be attributed to a number of technical constraints on domestic production as well as to some policy factors affecting both domestic production and the import of dairy products into Nigeria.

Table 2. Estimates of Self-Sufficiency in Milk Production (1970-1983).

Year	Dairy Imports	Self-Sufficiency Ratio			
		Low Yield	Intermediate Yield	High Yield	F.A.O. Data
	('000 MT whole milk equivalent)	(%)	(%)	(%)	(%)
1970	225.5	48.6	59.5	66.6	64.2
1971	251.8	46.6	57.6	64.8	44.6
1972	244.6	47.9	58.9	66.0	53.2
1973	190.1	55.3	65.8	72.3	59.0
1974	200.3	54.7	65.0	71.6	58.6
1975	325.3	43.2	54.2	61.6	52.9
1976	320.1	44.4	55.4	62.7	54.9
1977	509.9	34.0	44.5	52.1	43.3
1978	613.2	30.5	40.5	48.1	39.8
1979	464.8	37.5	48.2	55.8	47.5
1980	672.4	30.0	40.0	47.5	39.5
1981	659.6	31.0	41.1	48.7	40.3
1982	650.6	32.7	43.1	50.7	40.8

1983	795.4	28.9	38.7	46.2	35.6

Source: Nwoko (1985a)

Constraints on domestic milk production

11. Nuru et al (1978) among others, have identified insufficient fodder and lack of water supply, as the primary factors limiting livestock development in Nigeria. Others (Dettmers and Olotu, 1978) have identified the lack of high milk-yielding animals in the traditional herds and the low prices for fresh milk which create a disincentive to producers as additional limiting factors. Other important factors which constrain domestic milk production include the competition from imported dairy products, inefficient technical and extension services, inadequate labour supply as well as ecological factors.

12. Fodder. In Nigeria, up to 99% of cattle feed under traditional management is derived from bush grazing. The cattle are fed through free range systems in communal grazing lands or from crop residues which may or may not belong to the owner of the herd. The natural fodder usually lasts the rainy season. As the dry season approaches, the cattle move to graze low-lying swampy land called fadama. This movement proceeds from the drier parts in the north to the wetter parts in the south of the country and from high to lowland areas with the search for fodder and water. The consequences of inadequate feed are low milk yield, low resistance to diseases, and high mortality, particularly during the dry season. Although the southern parts of the country offer much better natural forage during the dry season, due to tsetse infestation, the cattle population in the south is low constituting only 3.9% of the natural total (see Walkers' technical cattle map in the Federal Livestock Department, Lagos).

13. Water supply. As a management practice, herdsmen do not fetch water for their cattle. Rather, they move with their herds to where they will find water in streams, dams, or puddles. During the dry season, and particularly drought years like that of 1963, most of such sources of water dry up in the northern states. In 1963 cattle and other livestock died in thousands. During normal dry seasons, however, the herdsmen move their cattle to fadama lands and to micro-ponds constructed under the Agricultural Development Projects (ADP). Some of the cattle may not survive the movement due to excessive heat and thirst. In the south, most streams run all year round so water is not as much a constraint to livestock production as are livestock diseases (see pare 12 above).

14. Low milk yield in stock. According to the World Bank (1981), the traditional Fulani cattle herd is typically made up of:

White Fulani	51.0 percent
Red Fulani	14.0 percent
Sokoto Gudali	11.5 percent
Adamawa Gudali	11.5 percent
Other local breeds	12.0 percent

This means that there are no exotic breeds or cross-breeds in a traditional herds. De Leeuw (1978) estimated that traditional cows in milk, yield 180 kg per animal per year. Ngere (1978) reported a much higher yield ranging from 610 kg to 900 kg, but this is unrealistically high for herds kept under traditional management systems. The FAO yield estimates range from 180 kg in 1970 to 290 kg in 1983. Neither the yield under traditional management nor that under experimental management or even FAO estimates compare with the yield of 2,682 kg per exotic cow per lactation as reported by Wilson et al (1976). The yield from traditional herds is low not only because of the type of stock kept but also because of the management practices

of the herdsmen.

15. Low milk price. According to CARD (1981), the estimated average zonal costs of milk production per litre are N 0.33, [1] N 0.33 and N 0.33 for the southern, middle belt and northern states respectively. The corresponding farm-gate prices for fresh milk were N 0.29, N 0.38 and N 0.29 respectively. This in effect means that milk producers in the southern and the northern states could not break even if they were to sell at the observed farm-gate prices. The milk producers in the middle belt states would make a profit of 6% on their average cost of production per litre. In 1981, the urban market price for fresh milk at Sokoto in the north was N 0.72 per litre, and N 0.46 per litre at Gombe also in the north. These were equivalent to 148% mark-ups at Sokoto and Gombe respectively.

1 The official rate of exchange of the Naira (to the US$) ranged from US$ 1.382 to US$ 1.830 during 1973-1983 (see FAO Trade Year Book, 1983)

16. Competition from imported dairy products. As mentioned in pares 7 and 8 above, both government and private milk processing plants prefer using imported dairy products to domestically produce fresh milk. From the plants' point of view the major reasons would seem to be not only convenience but also strictly more economic factors arising from the poor state of rural roads and the seasonal fluctuation in fresh milk supply, both to some extent affecting the collection cost. Combined with the highly localized nature of the marketed supply of fresh milk prevailing in the rural areas of Nigeria (see reasons giving rise to this in pare 6) this situation has virtually made the urban markets of the country the preserves of imported and recombined milk. The output of a few of the government's urban dairies which utilize raw milk from their own ranches is so insignificant that it does not command any respectable share of the urban market. Under these circumstances, although one can hypothesize that imported dairy products pose a stiff competition to domestically produced milk, it is in effect safe to say that the latter is excluded from the urban areas of Nigeria where 95% of wage-earners live. However, as we will find out later, it is equally safe to say that imports of dairy products have a depressing effect on domestic milk production, although the magnitude of such effect is very low in relative terms as a result of the segregated nature of the urban market.

17. Inefficient technical and extension services. The Federal Livestock Extension Service as it now stands provides a package of services which includes the following components:

(a) looking into reproductive problems,
(b) de-worming cattle,
(c) sales of drugs at 50% subsidy,
(d) helping in setting up legume pasture plots of up to 40 ha per household, and
(e) selling supplementary feeds of cotton-seed cake at 50% subsidy (FLD. 1982).

Each state has a core team of technical and extension staff consisting of one animal health officer, one animal production officer and one dairy technician. There are similar core teams in most of the states but they are not operational due to lack of mobility, lack of sense of duty and the generally unfavourable attitude of staff to work in rural areas. With this type of shortage of extension and technical services, cows die from preventable diseases while milk production from cows in milk falls much below what would be expected from the application of improved animal health and husbandry practices.

18. Inadequate labour supply. It has been reported by the Federal Department of Agriculture and Rural Development (FDARD, 1980) that housewives provide the milking labour for resident stock owners. But if the herd is large, not every lactating cow will be milked because of the limited number of wives. The herds of most absentee stock owners are milked only to meet the needs of the herding households because of shortage of labour.

19. Ecological factors. These are technical factors which make it difficult for cattle production to expand to all the states of the federation. Climatic factors as well as the prevalence of tse-tse flies in the rainforest zones would require the introduction of cattle breeds adapted to the conditions of the different ecological zones of the country.

20. Other constraints. Ekpere (1984) has identified a number of other constraints which include:

(i) absence of security in land use rights,
(ii) high requirements of commercial supplementary feed for modem dairy production, and
(iii) poor pasture management and grazing controls.

Policy objectives

21. There is not declared milk import policy on record in Nigeria. However, several policy objectives related to dairy imports could be inferred from some of the policy instruments employed by the government in the past and changes in the nature of some of these instruments over time. We can identify four policy objectives implied by some of the significant actions that the Nigerian Government has been taking in regard to dairy imports.

Satisfying urban consumer demand

22. Both before and after independence policy-makers in Nigeria seem to have been motivated by welfare considerations in meeting consumer demand for selected food items. This consideration has also been reflected in the country's external trade policy which made securing the maximum goods possible with the foreign exchange available and with the greatest ease, one of the priority government objectives (Nwoko, 1986). Milk has been one of those selected food commodities whose level of consumption has been used in determining the welfare level of the population.

23. Between 1973 and 1981 Nigerian commercial imports of dairy products increased on average by 15.4% per year but only 10.9% of this growth figure could be explained by changes in such variables as population, income or domestic milk production (von Massow, 1984). The remaining 4.5 increase was due to other causes which were mainly related to such factors as pricing and exchange rate policies pursued by the government. There is some evidence that prior to 1964 in Nigeria imports including imports of dairy products were facilitated by foreign exchange policies.

24. The case of procurement of imports was determined by the inter-changeability of currency or the convertibility of the pound (Federal Government of Nigeria, 1961). Currency was most easily exchangeable in the sterling areas as defined in the Exchange Control Ordinance of 1950 (Nigerian Government, 1950). Such areas included the "British Commonwealth (except Canada), any colony or trusteeship areas under Her Majesty's Dominion, British protectorates. Ireland, Iceland, Burma, Jordan and the United Kingdom of Libya." Importing goods and services from such areas was equivalent to domestic purchases of goods and services since the pound sterling was the unit of account.

25. The next best trade area in terms of inter-changeability of currency was the area defined by the Organisation for Economic Cooperation and Development (OECD). In this area there were..."special arrangements through which members settle their current import/export transactions with minimum foreign exchange difficulties" (federal Government of Nigeria, 1961). Since the United Kingdom was an OECD member, all the Commonwealth countries shared the benefits of its membership in the OECD. This special trade arrangement and the common unit of account of the sterling area facilitated the pursuit of a welfare policy regarding dairy imports during the period preceding 1964. However, as pointed out earlier, since imported dairy products were almost exclusively consumed by the urban population, the policy was biased toward meeting the demand of that sector of the country's population.

Raising government revenue

26. Another inferred policy objective of dairy imports is to raise revenue for the government. This was shown in the early taxation of imports of butter and cheese. Table 3 shows the

estimated duty collected from dairy products from 1970 to 1983. Historically, the highest amount of revenue from dairy products was about N 27 million in 1983. As a source of revenue, import duties on dairy products do not account for any significant percentage of the Nigerian Government's revenue. Between 1960 and 1979, the highest percentage attained was in 1978 when revenue from import duty on dairy products accounted for .003% of total current revenue and 1.3 of the combined revenue raised from customs duties and excise taxes.

Table 3. Estimated Import duty from Dairy Products

Year	Total Duty (in million N)
1970	2.415
1971	10.984
1972	4.602
1973	4.411
1974	1.919
1975	.479
1976	.734
1977	.728
1978	22.312
1979	20.471
1980	22.521
1981	22.165
1982	22.545
1983	26.633

27. Raising revenue through duties on dairy imports seems to conflict with the objective of meeting consumer demand for milk by means of imported products. If the quantities of dairy products imported are inelastic to the rate of duty, then there would be no conflict between the two objectives.

Controlling dairy imports to encourage domestic production

28. The infant industry argument, a classic in international trade theory (see Haberler, 1959), which involves protecting young domestic industries from foreign competition so that the domestic industries can nurse their productive strength to full capacity, became popular after Nigerian independence (Fajana, 1977). As new industries got established, the cry for protection got louder. Consequently, protection has been a popular objective in Nigeria's international trade policies which, although not explicitly declared, obviously covered dairy imports as is evident from some of the policy instruments utilized (see later discussion under import policy instruments).

Minimizing balance of payments problems

29. Since 1960 when Nigeria attained independence the colonial era concept of currency interchangeability was rechristened conservation of foreign exchange because of the need to minimize balance of payments problems. This is evident from Central Bank publications (Central Bank of Nigeria, 1963) and the budget speeches (Oluleye, 1973). This policy objective, again although not explicitly stated, was also applicable to dairy imports as we will see later from the discussion on instruments particularly those relating to foreign exchange policy. This objective also appears to conflict with that of meeting consumer demand for milk through imports.

Import policy instruments

30. Import licensing. Import licensing can be classified as open general or restricted. The open general import license is a notice published in the official gazette, permitting the importation of the goods covered by the license from any of the countries listed in the notice. It became legalized in 1950 with the definition of the sterling areas but was revoked in 1984. Dairy products were among the few commodities which enjoyed an open general import license. But occasionally, fresh milk was excluded from the open general license. Prior to 1959, the open general import license applied to the sterling areas, the OECD countries and the overseas possessions of the member of OECD countries. After 1959, it was extended to EEC countries and the United States of America.

31. Restricted import licenses are issued to import items which do not fall under the open general license. Such licenses are numbered and specify the quantity of goods to be imported and the countries from which such goods can be imported. Prior to 1959, payments in non-sterling currencies were not allowed for restricted license imports (Federal Government of Nigeria, 1961). Since 1959, payments can be made in any currency provided the commodity is imported a license. Currently, the import of every commodity is subject to a restricted license as decreed by the Military Government in 1984. So dairy products have now lost their preferential import position.

32. Import prohibition. The reasons why the importation of some products is prohibited are:

- to build the spirit of self-reliance by producing the good locally;
- to ensure the safety of the Nigerian Public;
- to preserve the local market for domestic products; and
- to save foreign exchange.

33. There were several import prohibition orders like those of 1959 and 1978 (Federal Ministry of Information, 1965; Federal Republic of Nigeria, 1978). But only the import of fresh milk was affected by the prohibition order of 1978. The same order also placed complete prohibition on the export of fresh milk from the country.

34. Import duties. Table 4 shows the extent to which duties were used in the control of dairy imports between 1958 and 1983. Specific duties were imposed on butter, and cheese and curd right from the period of the Second World her - 1939 to 1945. The rate of duty on butter increased from 8.8 kobo per kilogram in 1958 to 50 kobo per kilogram in 1983. The same range of duty also applied to cheese and curd over the same period.

Table 4. Tariffs on Dairy Imports

Year	Butter Kobo/kg	Cheese and Curd Kobo/kg	Milk Fresh (not Concentrated or sweetened) Fresh/Sour	Evaporated Milk	Milk. Cream and Dry
1958	8.80	8.00	Free	Free	Free
1959	18.00	8.00	Free	Free	Free
1960	22.0	22.00	Free	Free	Free
1961	22.00	22.00	Free	Free	Free
1962	22.0	22.00	Free	Free	Free
1963	22.00	22.00	Free	Free	Free

1964	35.00	35.00	Free	Free	Free
1965	35.00	35.00	40%	Free	40
1966	35.00	35.00	40%	Free	40%
1967	35.00	35.00	40%	Free	40%
1968	33.00	35.00	40%	40%	40%
1969	33.00	35.00	33.3%	40%	20%
1970	44.00	35.00	20%	33.3%	10%
1971	44.00	35.00	20%	20%	10%
1972	44.00	22.00	40%	10%	10%
1973	44.00	33.00	40%	10%	10%
1974	44.00	33.00	10%	10%	10%
1975	30.00	33.00	Free	5%	5%
1976	30.00	33.00	Free	Free	Free
1977	30.00	33.00	Free	Free	Free
1978	50.00	50.00	20%	Free	Free
1979	50.00	50.00	20%	10%	20%
1980	50.00	50.00	20%	10%	20%
1981	50.00	50.00	20%	10%	20%
1982	50.00	50.00	20%	10%	20%
1983	50.00	50.00	20%	10%	20%

Source: Laws of Nigeria, Federal Republic of Nigeria Official Gazette: Nigerian Trade Journal.

35. Milk, fresh and sour (not concentrated or sweetened), was duty free until 1965 when a 40% ad valorem tax was imposed. The rate of duty varied over the years until the product became duty free once more in 1975. Since 1978 when the import of fresh milk was banned, a duty of 20% had been in force for milk cream and fresh (not concentrated or sweetened) and also for dry and cream milk. Various categories of dairy products, with the exception of butter and cheese, have enjoyed varied periods of exemption from duty. Other than fresh milk, the one with the longest period of exemption from duty was evaporated m ilk.

36. Foreign exchange control. Since 1979, three systems of foreign exchange control of imports have been used. One is the Comprehensive Import Supervision Schemes (CISS). Another is the advance deposit (Central Bank of Nigeria 1979; 1980) while the third is direct foreign exchange allocation for imports.

37. The CISS involved "...a pre-shipment check on the prices, volume and quantity of imported goods worth over N 20,000". This system which was initiated to combat fraud in the import sector affects all commodities and all importers provided the import bill falls within the specified range.

38. The advance deposit scheme required that 50% to 200% of the value of the imports be deposited in advance. It was compulsory for a list of import items including dairy products until it was abolished in 1984 with the inception of specific duties for all visible imports (Federal Republic of Nigeria, 1984).

39. The third control measure is direct annual allocation of foreign exchange to the import sector. The allocation for all dairy imports in 1984 was N 200 million (Federal Republic of Nigeria, 1984). The fund is revolving in the sense that grants made in foreign exchange are

paid back in local currency. The overall allocation is further reallocated among various import items on the basis of national need.

Effects of policy instruments an dairy products import

40. To determine the responsiveness of dairy imports to import control measures, we can look at the policy objectives and see how far they have been achieved or we can look at the import of dairy products and determine how the policy instruments have affected them. The former is difficult because the policy objectives do not have quantitative targets. Even in the latter case, quantitative effects cannot be determined for every policy instrument.

41. Using real values for prices, duty, the level of external reserves as a proxy for foreign exchange allocation, per capita income as a proxy for consumer purchasing power, and domestic production of fresh milk as a proxy for local substitutes of imported dairy products, Nwoko (1985b) has summarized the overall effects of the policy instruments on dairy imports as shown in Table 5. Table 5 provides estimates of the magnitude of the response of the demand for each imported dairy product (an aggregate milk equivalent of all quantities and a weighted price are treated separately)

(a) to changes in its own border price,
(b) to changes in the border price of other products (i.e. cross-price elasticity)
(c) to changes in the respective levels of duty, external reserves, per capita income and domestic milk production.

Border prices are expected to be affected one way or the other by the utilization of the import policy instruments discussed earlier - e.g. import prohibition or imposition of import duties on a particular product are expected to increase domestic prices because of shortage or the added costs of importers subject to pay the duties.

42. As regards own price elasticities ((a) above), with the exception of cream and sour milk, the demand for every other dairy product is highly elastic to its own border price (the percentage change in the quantity demanded is higher than the percentage change in its border price). For example, a 10% increase (decrease) in the border price of condensed and evaporated milk will induce approximately a 28% decrease (increase) in the quantity of condensed and evaporated milk demanded. On the other hand, a 10% increase (decrease) in the border price of cream and sour milk will induce only a 0.7% decrease (increase) in the quantity of cream and sour milk demanded.

43. As regards point (b) above, some dairy products are substitutes to each other while others are complementary. For example, a 10% rise (fall) in the border price of dry milk will induce a 36% increase (decrease) in the quantity of butter demanded - i.e. butter is a substitute for dry milk. On the other hand, a 10% increase (decrease) in the border price of condensed and evaporated milk will induce approximately a 25% decrease (increase) in the quantity of butter demanded - i.e. condensed/evaporated milk and butter are complementary. There are question of symmetry and asymmetry which are rather complex and which we need not go into for our purposes.

Table 5. Elasticity of Policy Variables in Dairy Imports

Commodity	Butter	Cheese and Curd	Dry Milk	Cream and Sour Milk	Condensed and Evaporated Milk	Weighted Price	Duty	External Reserve	Per Capita Income	Domestic Milk Production

Butter	-1.897	-1.72	3.607	0.896	-2.469	-	-0.22	-0.552	0.567	-4.239
Cheese Curd	0.994	-1.692	1.972	1.365	-	-	0.604	-0.489	5.668	-2.385
Dry Milk	-1.864	2.014	-1.693	-0.603	-0.365	-	-0.109	0.549	-0.314	-1.374
Cream and Sour Milk	-	-2.695	-	-0.071	-	-	0.123	0.542	-	-0.912
Condensed & Evaporated Milk	0.864	-0.958	-	0.545	-2.825	-	0.135	0.116	0.462	0.198
Milk Equivalent	-	-	-	-	-	-1.084	-	0.153	0.403	-0.270

Source: (Nwoko, 1985b)

44. In respect of the other policy variables (point (c) above), import duty has negative effects only on the demand for butter and dry milk - i.e. a 10% increase in import duties on butter and milk is estimated to reduce their demand by 2% and 1% respectively. Cheese and curd, cream and sour milk as well as condensed and evaporated milk jump the duties imposed on them - for example, a 10% increase in duties on cheese and curd will induce not a decrease but a 6% increase in the quantity demanded. Despite the sign of the elasticity coefficients, generally all dairy imports are highly inelastic with respect to duty only - i.e. the percentage change in the quantities demanded is considerably less than the percentage change in the level of duties imposed. The import of cheese and curd is highly elastic with respect to per capita income while other dairy imports are highly inelastic. Any increase in the domestic production of fresh milk has a depressing effect on the import of every dairy product except condensed and evaporated milk with imports of butter, cheese and curd, and dry milk having high elasticities.

45. What all these relationships point to is that there does not appear to exist sufficient policy instruments for controlling dairy imports. Import duty is ineffective for cheese and curd, cream and sour milk as well as condensed and evaporated milk, which is the largest single item in the total value of Nigeria's dairy imports. The level of external reserves has positive effects on dry milk, cream and sour milk, and also on condensed and evaporated milk. The only policy instrument which can be used effectively for dairy import control in the long-run is an increase in domestic milk production, but again condensed and evaporated milk is insensitive to this instrument.

Effect of dairy import policies on domestic milk production

46. Domestic milk producers have no access to the urban markets wherein the purchasing power of the nation is concentrated. This means the loss of potential urban transmitted price signals to local producers which otherwise could have indicated the urban demand for increased domestic milk production. Would a ban on milk imports open up the urban markets to locally produced milk?

47. There are two major economic links between the urban and the rural markets - one micro and the other macro. The micro link is the consumer's allocation of his disposable income between imported products and products which are locally produced in rural areas. The macro link is the administrative decision by government to reallocate foreign exchange spent on dairy imports to the development of local production.

48. Let us assume that the Government has decided to ban milk imports and in the alternate invest, annually, an equivalent of the 1983 value of aggregate dairy imports on the development of domestic milk production. This means an incremental investment of N 188.6 million annually. In real terms, with 1974-75 as base year, the annual investment amounts to N 39.2 million, a figure equivalent to ten times the total actual investment in the whole dairy subsector in the 1970-75 plan period or eight times the total actual investment between 1975 and 1977 (see Nwoko, 1986). With a ban on dairy imports, the private sector milk recombining plants will either wind up or buy their whole milk from local producers. In the long-run they might in addition establish dairy farms in various parts of the country. So the incremental annual investment on local milk production might be higher than the actual government investment. The overall effect of banning dairy imports, a drastic policy measure, is not easily predictable. But there is bound to be organised private and public sector search for local substitutes.

49. A ban on dairy imports might be so drastic a measure that the government might be unwilling to adopt such a policy instrument. The government might alternatively consider reducing the foreign exchange allocation to dairy imports. The immediate effect of such a policy would be a fall in the quantity of dairy imports and a drastic rise in the prices of imported dairy products. There is bound to be a domestic price level for dairy produce beyond which a consumer would say, "This is too high, I have to do away with imported milk". This depends on the price elasticity of demand. The question is, would the consumer do away with milk entirely or would he go in search of locally produced milk? That is, would the consumer redirect his expenditure from imported milk to locally produced milk? This again depends on the upbringing and economic status of the consumer. The very high income earner would probably continue to buy imported milk at high domestic prices. Those who were brought up with milk, like the Hausas and Fulanis in the northern states, may divert to purchasing locally produced milk. The responses of the middle and low income earners who were not brought up on milk are not easily predictable.

50. With the rise in the domestic price of imported milk, would the high milk price stimulate the establishment of ranches in the southern states? The major problem in the expansion of ranches in the rainforest southern states is animal trypanosomiasis which is caused by the tsetse fly. This rules out the use of high milk yielding exotic cattle breeds in the south. But N'dama cattle are trypanotolerant and N'dama dairy ranches might spring up in the southern rainforest, tsetse fly zone.

51. Earlier we showed what the likely effects of domestic milk production, duty external reserves and per caput income are on the demand for imported dairy products. We also discussed what the likely implications (e.g. in terms of the magnitude of the investment required to develop domestic milk production) of a ban on dairy imports as a government policy instrument were. Let us now turn to what effect dairy imports and per caput income plus other variables have on domestic milk production. A preliminary investigative explanatory equation for domestic milk production shows the following relationships for the period 1960 to 1983.

$$\log Q_t = \log 5.991 - .027 \log M_t - .374 \log Y_t + .004 \log T - .183W \quad \text{... (eq. 1)}$$
$$\qquad\qquad\qquad\quad (.097) \qquad (.455) \qquad (.166) \qquad (.084)$$

$$R^2 = .43$$

where

Q_t = Estimated domestic milk production
M_t = Aggregate milk import
Y_t = Per capita income in real values
T = Time trend and
W = War factor (zero-one variable)

52. This result shows that domestic milk production is highly inelastic with respect to each of the independent variables. Although the magnitude is low, one should note that aggregate milk import has a depressing effect on domestic milk production. Increase in per capita income also has a depressing effect on domestic milk production, an effect with a larger magnitude than that of milk imports. This partially confirms our earlier view that the markets for domestically produced and imported milk are segregated.

The question of comparative advantage

53. The preceding discussions have shown that domestic milk production and dairy imports (aggregated) have an inverse relationship - i.e. an increase in one has a depressing effect on the other. Although the magnitudes in both cases are low, this relationship indicated prima facie that a policy of encouraging domestic milk production would seem to be an appropriate one. Yet it might be argued that Nigeria should not try and expand the production and marketing of fresh milk if it is relatively cheaper to import than to produce it locally. This is the traditional argument of comparative advantage. Although this is a relevant factor to consider, the national desire for self-reliance and self-sufficiency is driving most developing nations to expanding domestic production without really going into detailed consideration of the principle of comparative advantage. In the case of Nigeria, preliminary cost analysis (Nwoko, 1985a and 1985b) has shown that it is comparatively cheaper to produce fresh milk domestically than to import dairy products. This preliminary finding is still subject to further detailed analysis. There are such other side benefits of domestic production as employment generation and foreign exchange savings, which have not yet been included in the analysis of comparative advantage. For a country like Nigeria, with mass urban and rural unemployment and a declining foreign exchange base, these effects are likely to provide additional support to the case of domestic milk production and make it possible for government policy to support domestic producers rather than ban dairy imports.

Conclusion

54. The huge amount of foreign exchange which Nigeria continues to spend on dairy imports yearly is an indication that dairy import control policies have been ineffective. The declining self-sufficiency ratio shows that local milk production is not increasing as fast as the demand for milk. The question now is what can the nation do at this point? Should it continue with dairy imports paying only lip service to the desire for increasing domestic milk production or should it face the problems of local milk production squarely? This is a difficult issue for a nation whose urban inhabitants are so conscious of brand names. But it is a less difficult question for a nation whose foreign exchange earnings have taken a downward plunge. And it is an easy question for a country endowed with enormous land resources. Although the options are clear, the decision is more political than economic. Were it purely economic it would be more straightforward. We have, however, outlined the major constraints to local milk production. We have shown the effects of the policy instruments on dairy imports and the effects of dairy imports on domestic milk production. The likely implications of a more drastic control of dairy imports have been discussed. What is left is a political decision and a question of will-power to solve the problem of low domestic milk production in Nigeria.

References

CARD. 1981. A study of the cost of production and guaranteed minimum prices for selected livestock products in Nigeria. Department of Agricultural Economics, University of Ibadan, Ibadan, Nigeria.

Central Bank of Nigeria. 1963. Annual report and statement of accounts. Lagos.

Central Bank of Nigeria. 1979. Annual report and statement of accounts. Lagos.

Central Bank of Nigeria. 1980. Annual report and statement of accounts. Lagos.

David-West K.B. 1978. Dairy development in Nigeria - A review In: Proceedings of The First National Seminar on Dairy Development. Vom, July 10-13, Federal Livestock Department, Lagos.

Dettmers A and Olotu B C. 1978. Performance of cross-bred and pure-bred cattle in selected Nigerian dairies In: Proceedings of the First National Seminar on Dairy Development, Vom, July 10-13, Federal Livestock Department, Lagos.

Ekpere J A. 1984. Settlement of Fulani herdsmen in the sub-humid tropics of Nigeria: Problems and prospects. Journal of Development in Nigeria, v.1(1) Lagos.

Fajana O. 1977. Demand shortages: A case study of selected food imports in Nigeria. The Nigerian Journal of Economic and Social studies. v.19(1) No. 1 Lagos.

FAO. Production Year Book. (Several issues). Rome.

Federal Department of Agriculture and Rural Development (FDARD). 1980. Mambilla Plateau Development Plan, Animal Husbandry. Lagos.

Federal Government of Nigeria. 1961. Guide to Importers-Supplement to the Nigerian Trade Journal v. 9(3), Lagos, Nigeria.

Federal Livestock Department (FLD). 1982. "Annual report". Lagos.

Federal Ministry of Information. 1965. Customs and Excise Notices 1959-64. Lagos.

Federal Ministry of Planning. 1975. Third National Development Plan. Lagos.

Federal Republic of Nigeria. 1978. Import Prohibition Order 1978. Legal Notice No. 16 of 1978. Laws of Nigeria. Lagos.

Federal Republic of Nigeria. 1984. Budget speech by Major General Buhari. Lagos.

Haberler G von. 1959. The Theory of International Trade. William Hodge and Company Ltd., London.

de Leeuw P N 1978. Feed requirements of pastoral milk production herds in the Savanna region. In: Proceedings of the First National Seminar on Dairy Development, Vom, July 10-13 Federal Livestock Department, Lagos.

von Massow V H. Dairy imports into sub-Saharan Africa: Development and policies. LPU Working Paper No. 4, ILCA, A.A.

Nigerian Government. 1950. The sterling area. Laws of Nigeria. Lagos, Nigeria.

Ngere C O. 1978. The role of indigenous breeds in milk production. In: Proceedings of the First National Seminar on Dairy Development. Lagos.

Nuru S., de Leeuw P N and Abalu C O. 1978. The potentials for livestock production in the River Basin Irrigation Schemes in Nigeria. Paper presented at the 1978 Irrigation Cropping Scheme Meeting, I.A.R. Ahmadu Bello University, Zaria, Nigeria.

Nwoko S G. 1985a. Estimating domestic milk production in Nigeria (In press).

Nwoko S G. 1985b. Determinants of dairy imports in Nigeria (In press).

Nwoko S G. 1986. The development of dairy imports in Nigeria. Forthcoming LPU Working Paper. ILCA. Addis Ababa.

Obi A C. 1983. Prospects for dairy development in Nigeria. Paper presented at the Eighth Annual Conference of the Nigerian Society of Animal Production. Port Harcourt, Nigeria.

Oluleye, Major General J J. 1978. Federal budget details 1978-79. The Nigerian Trade Journal v.25(2).

Wilson F A, Olayiwole M B Agwuna E N and Ogunsuyi. 1976. Dairy projects and vaccine production evaluation. Federal Livestock Department, Kaduna, Nigeria.

World Bank Review Mission. 1981. The green revolution: A livestock production plan for Nigeria. Report commissioned by the Federal Ministry of Agriculture and the Green Revolution National Committee.